DOCUMENT RESUME

ED 129 872 TM 005 673

TITLE Visual Concepts Program: An Evaluation Report.
INSTITUTION Phoenix Union High School District, Ariz. Dept. of Research and Planning.
NOTE 18p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Analysis of Covariance; Evaluation Methods; *Multimedia Instruction; *Performance Contracts; *Program Evaluation; Reading Comprehension; *Reading Skills; Reading Speed; *Secondary Education; Video Tape Recordings

ABSTRACT

Starting with the second semester of the 1971-72 school year, the Phoenix Union High School System accepted a performance contract with Educators Service Incorporated of Edina, Minnesota. The contract enabled the district to implement a one-semester program, which was a multimedia course consisting of 36 thirty-minute videotaped sessions which were divided into eight skill progression phases: initial testing, preview skill, recall skill, learning techniques, re-focus and review evaluation, memory skills, vocabulary and depth reading skills, and achievement tests and evaluation. The performance contract guaranteed certain increase in reading rate and reading comprehension. These guarantees were not entirely met, but there was significant improvement in these reading skills, and the evaluation report recommended the purchase of the videotapes used. (Author/BW)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED120378

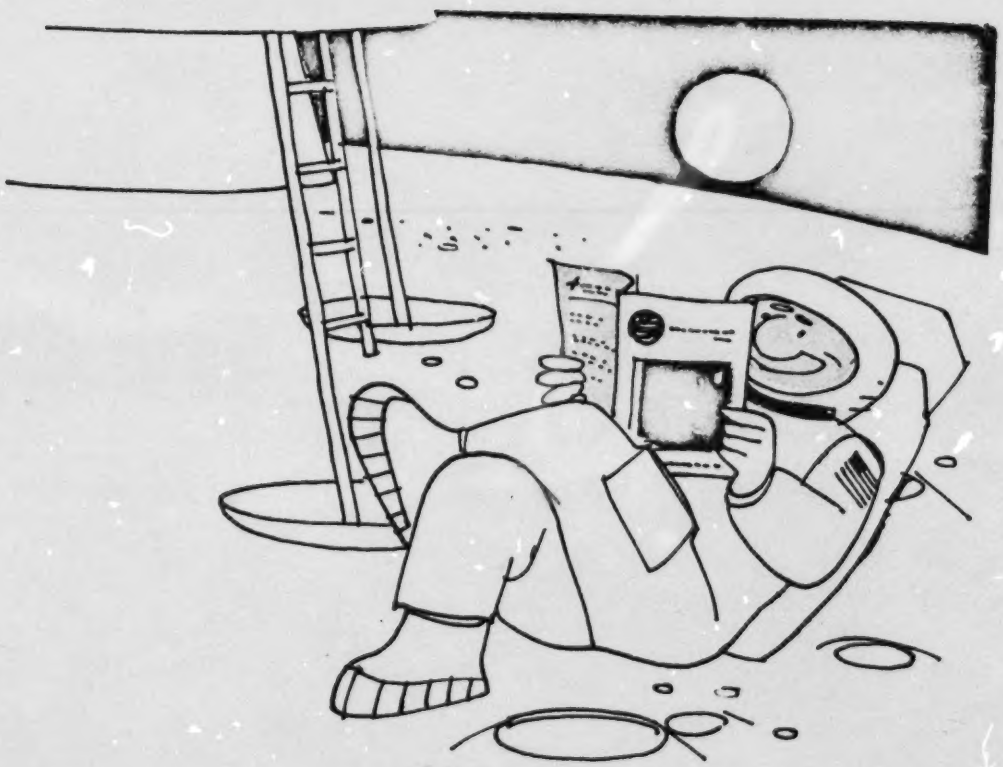
RESEARCH & PLANNING

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

TM005 678

PHOENIX UNION HIGH SCHOOL SYSTEM

VISUAL CONCEPTS PROGRAM
(An Evaluation Report)



DEPARTMENT OF RESEARCH AND PLANNING
Lloyd W. Colvin, Director

VISUAL CONCEPTS PROGRAM
(An Evaluation Report)

INTRODUCTION

Starting with the second semester of the 1971-72 school year, the Phoenix Union High School System accepted a performance contract with Educators Service Incorporated of Edina, Minnesota (Appendix A). The contract enabled the District to implement a Visual Concepts Perceptive Reading Development and Applied Study Skills Course at Alhambra, Camelback, and East.

The one-semester program was a multi-media course consisting of 36 thirty-minute video taped sessions which were divided into eight skill progression phases: 1) initial testing, 2) preview skill, 3) recall skill, 4) learning techniques, 5) re-focus and review evaluation, 6) memory skills, 7) vocabulary and depth reading skills, 8) achievement tests and evaluation. The phases were sequential and cumulative, and structured on a concept of programming reading skills for video teaching and learning. It was hoped that motivation and individual achievement would be triggered through the correlation of video lessons with the reading techniques book, five modern paperbacks and audio reinforcement records for added drill and skill practice.

District teachers conducted the video course after being given a pre-service workshop.

HYPOTHESES:

The performance contract with Educators Service Incorporated guaranteed results as follows:

1. The Reading Efficiency Index of students who have been given reading instruction via the video tapes will increase 150%. (Reading

Efficiency Index equals rate times comprehension).

2. Class mean comprehension of the experimental group will improve a minimum of 10 percentile points if pre-test shows class mean is below the 50th percentile; class mean comprehension will maintain or improve if pre-test shows class mean at or above the 50th percentile.
3. Class mean reading of the experimental group will increase 30 percentile points if pre-test scores show class mean below the 60th percentile; class mean reading ratio will finish at or above the 95th percentile on the post-test if pre-test class mean was at the 60th percentile or above.
4. Class mean on the total score of the Nelson-Denny Reading Test will be statistically significant at the .05 level of confidence over the class mean in college reading, taught by a District reading teacher at Maryvale High School using District reading materials.

THE MODIFIED PERFORMANCE CONTRACT:

In most performance contracts the company, not the district exercises control over teaching procedures, employment of staff, etc. The contract with Educators Service Incorporated allowed the district to choose the physical location, student population, and professional staff. The district agreed, however, to use the video tapes and purchased the software for $4,000. It further agreed to purchase the tapes ($7,000) if all 4 hypotheses were verified.

THE EVALUATION DESIGN:

Basically, the design called for a pre-test - post-test, experimental vs control group design. It can be depicted as follows:

Experimental group	O_1 X O_2
Control group	O_1 O_2

Where O_1 = pre test; O_2 = post test; and X = the effect of the video tapes (treatment variable).

The following students were identified as the experimental group: Four sections of reading students at Alhambra, five sections at Camelback, and four sections at East. The control group consisted of five reading classes at Maryvale. These students, of course, did not receive any instruction via the video tapes.

The criterion variables (reading comprehension, reading rate, and reading efficiency - defined as reading rate times comprehension) were measured by the Nelson Denny Reading Test, both forms A and B, and the Einstein Test which is a part of the Visual Concepts television tapes. Mean scores were compared for each group, pre and post. The influence of the independent variable (video tapes plus software vs no video tapes) upon the criterion (dependent variables) was determined.

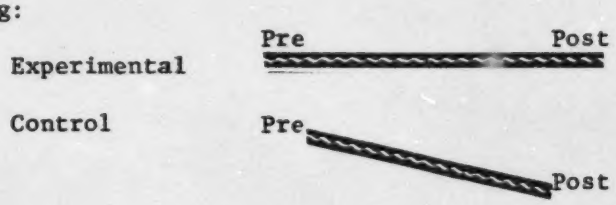
Several "t" tests were used (1) to determine where the groups stood initially on the criterion measures (reading comprehension and reading rate) and (2) to determine statistically significant differences on the post-test.

A measurement problem ensued, however, which prevented the use of a "t" test for dependent samples (one group comparison from pre to post). The two forms of the Nelson Denny Test (A and B) were not equivalent in terms of difficulty. For example, a person scoring 24 on the test for reading comprehension is at the 50th percentile on form A, but at the 54th percentile on form B. Therefore, it was impossible to determine gains made

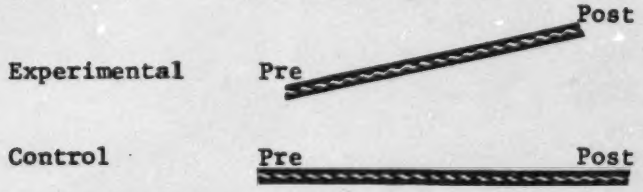
from the pre to post test for one group without a standard score conversion, which the test publisher does not provide.

There was a way to skirt this measurement issue, however, and still judge the relative gains made by the two groups, and that is by using the Analysis of Covariance. A further advantage in using this statistical technique is to equate differences that may have existed on the pre test, or some other variable such as ability.

For example, if the post-test was more difficult than the pre-test (which it was in this case) and if the experimental treatment was effective, the relationship between the two groups from pre to post may have looked like the following:



If we were to use a "t" test (dependent samples) for the experimental group, no gain would be evident, but in our case that conclusion would be confused with the differences in the difficulty of the two forms of the test. However, the Analysis of Covariance would pick up the relative differences and the same "F" ratio would result for the above pattern as for the pattern below, where the tests are more parallel in difficulty.



The result would be the same since the Analysis of Covariance technique compares the regression lines of the two groups, thus measuring the relative gains (or losses) of the two groups.

As was mentioned earlier, the Analysis of Covariance technique also controls for differences which may be naturally present on some variable at the beginning of

the experiment. What are some natural variables to look at? One of course would be the California Test of Mental Maturity. The experimental group possessed a mean I.Q. of 113, while the mean for the control group was 116, not far different, particularly considering the measurement error in ability testing.

Grade level may have also been a factor sicne 10th, 11th, and 12th grade students were in each group. However, the mean grade level for the experimental group was 11.22 and 11.26 for the control group, again not much difference.

Significant differences did occur, however, on the pre-tests, both in reading comprehension and reading rate. It was decided then to use these two variables as the covariates. To insure that the treatment (x) had a chance for measured effect, any student in the experimental group who missed two consecutive tapes or three total tapes during the semester was eliminated in the analysis of the data. In the control group, any student who missed four consecutive days or six total days in the semester and who did not make up the work was likewise eliminated. Included in the analysis were those students with pre and post test data.

THE DATA

To test hypotheses #1 (Reading efficiency rate will increase 150%) the means (pre and post) were compared as follows.

TABLE 1

Gains in Reading Efficiency

	PRE TEST		POST TEST		
	Mean	σ	Mean	σ	Percent Increase
Experimental Group	238.24	90.73	591.50	288.61	148.27%

There was a great increase in reading efficiency, particularly since reading efficiency is defined as reading rate times comprehension and particularly since the increase of 353.26 represents an increase in the average score, not just for a few individuals. Even though the mean score more than doubled, the first hypothesis was not verified. The experimental group fell short of its goal by 1.73 percent.

To test the second hypotheses, the following data were collected and analyzed as shown in Table #2.

TABLE 2

Reading Comprehension Gains

	PRE-TEST				POST-TEST			
	N	Mean	σ (S.D.)	%tile*	N	Mean	σ (S.D.)	%tile*
Experimental Group	354	38.49	11.25	62nd	354	42.40	13.10	73rd
Control Group	124	42.80	12.16	73rd	124	47.87	12.86	84th
"t" tests (Independent Samples)	t = 3.580 (Comparing the two groups on the pre-test)		Significant at .01 level of confidence		t = 4.00 (Comparing the two groups on the post-test)		Significant at .01 level of confidence	

* %tiles were interpolated between scores on 11th grade norms and further corrected to account for the fact that the mean grade level for the experimental group was 11.22 and 11.26 for the control.

Hypothesis number 2, then, was verified by the data (Table 2). The experimental group was above the 50th percentile (62nd) initially and the group improved their mean ranking on the post-test by 11 percentile points (73rd percentile).

Note that statistically significant differences existed between the two groups on the pre-test as well as the post-tests (Table 2). Note also that both groups made significant gains from pre to post, even though the form of the test taken as a post was more difficult than the pre.

Not part of the hypotheses as contract; but still of interest is the fact that the control group also made an eleven point gain (percentile) from pre to post (73rd to 84th) as is shown in Table 2.

Hypotheses #3 was tested by comparing pre and post tests for <u>reading rate</u> as is shown in Table 3.

TABLE 3

Reading Rate Gains

	PRE-TEST				POST-TEST			
	N	Mean	σ (S.D.)	%tile*	N	Mean	σ (S.D.)	%tile*
Experimental Group	358	217.06	69.55	39th	358	676.53	241.60	99th
Control Group	125	271.99	85.23	63rd	125	453.39	115.34	97th
"t" tests (Independent Samples)	t = 7.128 (Comparing the two groups on the pre-test)		Significant at .01 level of confidence.		t = 9.821 (Comparing the two groups on the post-test)		Significant at .01 level of confidence.	

* %tiles were interpolated between scores on 11th grade norms and further corrected to account for the fact that the mean grade level of the experimental group was 11.22 and 11.26 for the control.

Hypotheses number 3 was verified by the data (Table 3). The group mean or the pre-test was below the 60th percentile (39th). On the post-test, a score of 488 would have been at the 99th percentile, but the group mean was 676.53. To put it mildly, the experimental group blew the lid off the top of the test, and gained not 30 percentile points, but 60.

The experimental group scored significantly higher on the pre-test as well as the post (Table 3) than the control group. As a point of interest, the control group did very well also going from a pre-test percentile of 63 to the 97th percentile on the post.

To test hypotheses number 4 the Analysis of Covariance was utilized. The relative gains made by each group as well as controlling for the obvious differences existing between the two groups on the pre-tests were measured by this technique. The data are as follows:

TABLE 4

Relative Gains in Reading
Comprehension and Reading Rate
by Experimental and Control Groups

GROUP	READING COMPREHENSION			READING RATE		
	N	"F" Ratio*	Significance	N	"F" Ratio*	Significance
Experimental Group	354	6.7	sig. at .05 level	358	145.6	sig. at .01 level
Control Group	124			125		

* as determined by Analysis of Covariance.

Hypothesis #4, then was also verified. The experimental group gained relatively more in both reading comprehension and particularly reading rate when compared to the control group.

CONCLUSIONS AND RECOMMENDATIONS

1. With the exception of realizing an increase of 150% in reading efficiency (rate X comprehension), the video tapes and software supplied by Educators Service Incorporated reached or exceeded all expectations. Reading efficiency did increase by 148.27%, or only 1.73% short of the goal.
2. Both the experimental and control groups made significant gains in reading comprehension and reading rate, but the experimental group made relatively larger gains when controlling for differences that existed on the pre-test.
3. Reading rate gains were more significant than reading comprehensions gains. The experimental group reached the 99th percentile on the post-test as compared with the nationally normed group after starting only four months before at the 39th percentile.
4. It is recommended that even though the district is not compelled to purchase the video tapes, at a cost of $7,000, consideration be given to purchase them based on the results of this study.

LWC:gc:mk
7-12-72

APPENDIX A
MODIFIED PERFORMANCE CONTRACT
BETWEEN
PHOENIX UNION HIGH SCHOOL DISTRICT AND EDUCATORS SERVICE INCORPORATED

Educators Service Incorporated proposes to improve the reading rate, comprehension level and study skills of selected Phoenix Union High School System students through the implementation of the Visual Concepts Perceptive Reading Development and Applied Study Skills Course during second semester of the 1971-72 school year.

A. Educators Service Incorporated guarantees results as follows:

1. The Reading Efficiency Index will increase 150%. The R.E.I. will be determined by computing the difference between pre and post test results of the Einstein test, based on class mean.
2. Following results from the Nelson-Denny test Forms A and B the class mean comprehension difference between pre and post tests will be
   a. maintained or improved if pre-test shows class mean at or above the 50th percentile.
   b. improved a minimum of 10 percentile points if pre-test shows class mean below 50 percentile.
3. Following results from the Nelson-Denny test Forms A and B the class mean reading rate difference between pre and post tests will be
   a. increased 30 percentile points if pre-test shows class mean below 60th percentile,
   b. at or above 95th percentile on post-test if pre-test class mean was at the 60th percentile or above.

4. Experimental group class mean on the comprehension and reading rate score of the Nelson-Denny Reading Test will be statistically significant at the .05 level of confidence over the class mean of the control group on the total score of the Nelson-Denny Reading test.

The control group will consist of approximately 100 students taking a college-bound reading course at Maryvale High School. The course will be taught by a District reading teacher using District reading materials. Appropriate adjustments for statistically equating the control and experimental groups will be made by the District Research and Planning Division using the Analysis of Covariance Technique.

B. Educators Service Incorporated agrees to provide the following:

1. a pre-service workshop for staff and students in the program,
2. an in-service workshop during the course for staff and students in the program,
3. all course materials to include consumable workbooks, practice records, required paperbacks, test booklets, answer sheets and student inventory forms,
4. thirty six half-hour video tape lessons for use during the 1971-72 school year at no charge.

C. Educators Service Incorporated agrees that the Phoenix Union High School District will choose physical location, student population and professional staff.

D. The Phoenix Union High School District agrees to the following:

1. the course will be given a minimum of two times a week in the second semester of the 1971-72 school year during regular school hours,

2. the professional staff assigned to teach the course at the beginning of the second semester will be expected to remain with the same class throughout the duration of the course, barring illness or other unexpected misfortune,

3. Educators Service Incorporated representatives will be allowed to audit the course operation and offer suggestions,

4. the Phoenix Union High School District will remit $4,000 for software to Educators Service Incorporated 30 days after the course is initiated. This cost will not be refundable.

E. Upon conclusion of the program the Phoenix Union High School District will

1. purchase the 36 one-inch video tapes for $7,000 if post-test results meet performance criteria. That amount will be due and payable 30 days after test results are submitted to the Phoenix Union High School District Board of Education, and after July 1, 1972,

2. return video tapes to Educators Service Incorporated in good condition if post test results do not meet performance criteria within 30 days after final test results are submitted to the Board of Education, at no charge,

3. permit Educators Service Incorporated to use class mean pre and post test data for promotional purposes upon successful conclusion of the contract.

LWC:gc:mk
7-12-72